

43. (New) An apparatus as claimed in claim 1,

wherein the thermoforming machine is fitted with at least one counter-die, the at least one female die and counter-die being reciprocally approachable and removable for the operations of closing, thermoforming and opening,

the apparatus further comprising a feeder for feeding thermoforming material between each female die and counter-die,

wherein the receiving station is a receiving conveying template including retention surfaces adapted to engage each thermoformed article, at least one surface of said retention surfaces being defined by at least a portion of a wall of a cavity in an element associated with the conveying template, the cavity communicating with at least one exterior surface of the element and having an interior dimension which is smallest in a region remote from said exterior surface to define a shoulder thereat for resiliently holding a thermoformed article disposed in the cavity.

44. (New) An apparatus as claimed in claim 1,

wherein the thermoformed articles have rims and wherein the equatorial shoulder includes a slightly undercut, internal angle of incidence, in order to allow insertion by the thrust of a rimmed thermoformed article and enable it to be resiliently constrained and held firmly in position at its rim.

Please amend the claims as indicated below:

1. (Four times amended)

A thermoforming apparatus comprising:

a thermoforming machine fitted with at least one female die [and counter-die reciprocally approachable and removable for the operations of closing, thermoforming and opening]; and

[a feeder for feeding thermoforming material between each female die and counter-die;]

~~E2~~ extraction pick-up means adapted to withdraw a thermoformed article from the female die and to transfer it to a receiving [receiving] station [conveying template], [at least one of] said extraction pick-up means [and said conveying template] including a receiving hole for each thermoformed article to be extracted, each receiving hole being defined along its depth by two annular surfaces reamed in opposite directions and defining between them an equatorial shoulder for engaging and positioning each thermoformed article.

~~E3~~ 3. (Three times amended) A thermoforming apparatus as claimed in claim 44 [1], further comprising a carousel conveyor with a plurality of bearing arms and associated conveying templates, each conveying template being fitted with said equatorial shoulder for the retention of the thermoformed articles in correct orientation while they are being conveyed, stepwise and synchronously with the opening-closing rate of

the dies, through at least one work and/or treatment station positioned around the carousel conveyor.

4. (Three times amended) An apparatus as claimed in claim 43 [1], wherein the thermoformed articles have rims and wherein the equatorial shoulder includes a slightly undercut, internal angle of incidence, in order to allow insertion by the thrust of a rimmed thermoformed article and enable it to be resiliently constrained and held firmly in position at its rim.

E3  
Sub  
G3  
5. (Four times amended) A thermoforming apparatus as claimed in claim 43 [1], further comprising:

a chain conveyor wound by a pair of chain wheels and having a run thereof extending along the respective die or counter-die but beyond the encumbrance thereof; and

wherein said extraction pick-up means [mean] comprises a plurality of extraction plates carried at predetermined intervals from each other on said conveyor, each extraction plate being fitted with said receiving holes with equatorial shoulders for retaining the thermoformed articles in proper orientation during their conveyance.

Sub H2  
6. (Five times amended) A thermoforming apparatus as claimed in claim 43 [1], further comprising a template conveyor extending through at least one work and/or

E3  
Sub H27  
treatment station and moving stepwise at the opening-closure rate of the dies for receiving thermoformed articles from an extraction plate associated with said extraction pick-up means, said extraction plate withdrawing a thermoformed article from the female die and [to] transferring it to said conveying template, said template conveyor conveying the thermoformed articles in sequence to said at least one work and/or treatment station along the template conveyor.

E4  
Sub H57  
10. (Four times amended) A thermoforming apparatus as claimed in claim 43 [1], further including a truncated conical collar seated in each receiving hole for precise location of a respective thermoformed article on a surface of the conveying template.

E5  
Sub H77  
14. (Four times amended) A thermoforming apparatus as claimed in claim 10, wherein the thermoformed articles have rims and wherein said conveying template has a peripheral recess formed on the surface of the template about the receiving hole for engaging the rim of a thermoformed article received in the receiving hole.

E6  
22. (Five times amended) A thermoforming apparatus as claimed in claim 43 [1], wherein the thermoformed articles have rims and wherein said receiving hole has a support shoulder for shallow, thermoformed articles arranged between each receiving hole, said equatorial shoulder including an annular projection which engages the internal diameter of the rim of the article.

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25. (Two times amended) A thermoforming apparatus comprising at least one female die and counter-die reciprocally approachable and moveable for the operations of closing, thermoforming and opening, a feeder apparatus adapted for feeding thermoforming material between each female die and counter-die, and an extraction pick-up apparatus adapted to withdraw at least one thermoformed article from the female die and to transfer said at least one thermoformed article to a receiving conveying template, [at least one of the extraction pick-up apparatus and] the receiving template including [a] retention surfaces adapted to engage each thermoformed article, at least one retention surface of said retention surfaces being defined by at least a portion of a wall of a cavity in an element associated with [at least one of the extraction pick-up apparatus and] the receiving conveying template, the cavity communicating with at least one exterior surface of the element and having an interior dimension which is smallest in a region remote from said exterior surface to define a shoulder thereat for resiliently holding a thermoformed article disposed in the cavity.

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28. (Two times amended) The thermoforming apparatus of claim 27 wherein the two annular surfaces intersect each other at a plane which is disposed perpendicular to an axis of the cavity.

REMARKS

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Examiner's objections will be addressed in the sequence in which they were made.

Examiner's numbering of his Office Action will be used.

2.

A new oath or declaration will be filed as soon as the executed form is received from the inventor.

3.

The status of the parent application 08/481, 458 has been updated.

4.

Claims 1, 6 and 14 have been amended in order to overcome Examiner's objections.

5. - 6.

The wording of claims 25 and 28 has been changed in order to overcome Examiner's rejections. Claims 34, 39 and 42 have been deleted without prejudice.

8.

In his last Official Action, the Examiner has rejected claims 1 and 4-42 under 35 USC 103(a) as being unpatentable over GB 2, 263, 660 taken together with WO 94/15863.

a) Claim 1

Claim 1 as now amended enjoys an earlier effective filing date for the subject matter disclosed by PCT application PCT/EP93/03700, published under the number WO 94/15863. In fact, the present application is now a CIP of US 08/481,458 based on PCT/EP93/03700, which claims priority to Italian application VR93A000002, filed on January 12, 1993. Therefore, the subject matter claimed in claim 1 antedates both GB 2, 263, 660 and WO 94/15863. This is supplemented by the fact that the subject matter claimed in claim 1 as now amended is fully supported by the parent application US '458. In particular, Figures 11-13 of the parent application '458 (which is the US national stage of PCT publication WO 94/15863) disclose a pick-up means (2 in WO 94/15863) including a receiving hole for each thermoformed article to be extracted, each receiving hole being defined along its depth by two annular surfaces (31, 32 in WO 94/15863) reamed in opposite directions and defining between them an equatorial shoulder for engaging and positioning each thermoformed article (10 in WO 94/15863). Moreover, the parent application '458 makes also reference to a receiving station. See for example page 9, line 3 ("collection station") or page 12, line 17 ("receiving station") of WO 94/15863. It is therefore submitted that claim 1 as now amended is patentable.

b) Claim 43

In order to show patentability of claims 4-42, it has first to be noted that a new claim 43

has been introduced. This new claim 43 depends from claim 1 and claims in particular that the receiving station is a receiving conveying template including retention surfaces adapted to engage each thermoformed article, at least one surface of said retention surfaces being defined by at least a portion of a wall of a cavity in an element associated with the conveying template, the cavity communicating with at least one exterior surface of the element and having an interior dimension which is smallest in a region remote from said exterior surface to define a shoulder thereat for resiliently holding a thermoformed article disposed in the cavity.

This feature is neither shown nor implied in GB 2,263,660 or WO 94/15863. GB 2,263,660 provides a general disclosure of a thermoforming apparatus, comprising a thermoforming machine fitted with a female die, a counter-die and a pick-up head. WO 94/15863 discloses a pick-up head, in particular several structures thereof for engaging/disengaging the hollow objects picked up. The combination of these two documents does not bring to the subject matter claimed in new claim 43, because there is no disclosure of the particular shape of the receiving conveying template. Moreover, the person skilled in the art, starting from the particular shape of the pick-up means disclosed in Figures 11-13 of WO 94/15863 (i.e. the two annular surfaces reamed in opposite directions and defining between them an equatorial shoulder) would have no teaching in coming to a structure like that claimed in claim 43. In fact, the subject matter of claim 43 does not claim a structure similar to the structure of the hole in the pick-up



head of Figures 11-13 of WO 94/15863, but rather structures like those disclosed in Figures 19 to 53 of the present application. Incidentally, a structure like the structure disclosed in Figures 11-13 of WO 94/15863 would not be suitable for a receiving template, i.e. when inserting the thermoformed articles starting from their bottom and not from their top. It is therefore submitted that claim 43 is patentable over GB 2, 263, 660 taken together with WO 94/15863.

c) Claims depending on claim 43

Claims 3, 4, 5, 6, 10 and 22 have been made dependent on claim 43. Moreover, claims 7, 8, 9, 15, 16, 17, 19, 20, 23 and 24 depend on claim 6, claims 11, 12, 13 and 14 depend on claim 10, claim 18 depends on dependent claim 18, and claim 21 depends on dependent claim 20. Therefore, also those claims have to be considered patentably distinct from the prior art.

d) Claim 25

Similarly to what claimed in claim 43, independent claim 25 claims, inter alia, a receiving template including retention surfaces adapted to engage each thermoformed article, at least one retention surface of said retention surfaces being defined by at least a portion of a wall of a cavity in an element associated with the receiving conveying template, the cavity communicating with at least one exterior surface of the element and having an interior dimension which is smallest in a region remote from said exterior surface to

define a shoulder thereat for resiliently holding a thermoformed article disposed in the cavity.

This feature is neither shown nor implied in GB 2,263,660 or WO 94/15863. The same arguments with reference to claim 43 above apply. It is therefore submitted that claim 25 is patentable over GB 2, 263, 660 taken together with WO 94/15863.

e) Claims depending on claim 25

Claims 26-30 are directly or indirectly dependent on claim 25. Therefore, also those claims have to be considered patentably distinct from the prior art.

f) Claims 31 to 42

Claims 31 to 42 have been deleted without prejudice

g) Claim 44

New claim 44 has been introduced, dependent on claim 1. In this claim it is claimed that the thermoformed articles have rims and that the equatorial shoulder includes a slightly undercut, internal angle of incidence, in order to allow insertion by the thrust of a rimmed thermoformed article and enable it to be resiliently constrained and held firmly in position at its rim. This feature is neither shown nor implied in GB 2,263,660 or WO 94/15863. It is therefore submitted that claim 44 is patentable over GB 2, 263, 660 taken

together with WO 94/15863.

9.

In his last Official Action, the Examiner has rejected claim 3 under 35 USC 103(a) as being unpatentable over GB 2, 263, 660 taken together with WO 94/15863 and US 3,966,386. Claim 3 as now amended has been made dependent on claim 43, which claim discloses features that are neither disclosed nor suggested in GB 2, 263, 660 or WO 94/15863 or US 3,966,386. See also item 8b) above. It is therefore submitted that claim 3 is patentable over the cited prior art.

10.

In his last Official Action, the Examiner has rejected claims 1, 4 and 25-42 under 35 USC 103(a) as being unpatentable over US 4,560,339 in view of German Patent 3,928,301.

a) Claim 1

Claim 1 as now amended discloses, inter alia, pick-up means including a receiving hole defined along its depth by two annular surfaces reamed in opposite directions and defining between them an equatorial shoulder for engaging and positioning each thermoformed article.

Neither US 4,560,339 nor German Patent 3,928,301 disclose this feature. With reference

in particular to German Patent 3,928,301, Figure 1 does not show “a receiving hole defined along its depth by two annular surfaces reamed in opposite directions and defining between them an equatorial shoulder”. On the contrary, Figure 1 of German ‘301 only discloses holes (7 in ‘301) which match the shape of the thermoformed articles. See also column 2, lines 5-7 of ‘301: “Durchbrüchen 7 in der Anzahl der geformten Gegenstände 5, die dem Stanzmaß der Gegenstände 5 angepaßt sind”, i.e. holes 5, in the number of the formed articles, the shape of which corresponds to the shape of the articles 5. This is different from the present invention as claimed, in which the shape of the hole doesn’t need to be the same of the thermoformed articles (see WO 94/15863, Figure 12), but on the contrary makes use of two annular surfaces reamed in opposite directions in order to allow first a deformation along the first annular surface (numeral 31 in Figure 12 of WO 94/15863) and then an expansion along the second annular surface (numeral 32 in Figure 12 of WO 94/15863). In this way articles of different shapes can be picked up, differently from German ‘301, where only articles having a shape matching that of the hole can be picked up. Claim 1 is therefore patentable also over US 4,560,339 when taken in combination with German Patent 3,928,301.

b) Claim 4

Claim 4 as now amended depends on claim 43. Claim 43 discloses a particular conformation of the receiving conveying template (see also point 8b) above) which is neither disclosed nor implied in US 4,560,339 or German Patent 3,928,301. It is therefore

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submitted that claim 4 is patentable also over US 4,560,339 when taken in combination with German Patent 3,928,301.

c) Claims 25-30

Claim 25 claims, inter alia, a feature which is similar to the feature of Claim 44. See also point 8d) above. It is therefore submitted that also claim 25 and its dependent claims 26-30 are patentable also over US 4,560,339 when taken in combination with German Patent 3,928,301.

d) Claims 31-42

Claims 31-42 have been deleted without prejudice.

11.

Claim 1 has now been amended in order to fully comply with the subject matter disclosed in the parent application US '458. See also point 8a) above.

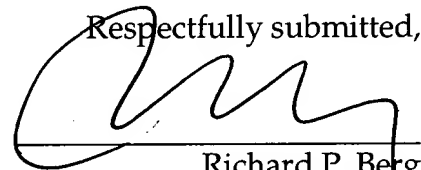
For the reasons explained above, favorable reconsideration of the present application is respectfully requested.

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The Commissioner is authorized to charge any additional fees which may be required or credit overpayment to deposit account no. 12-0415. In particular, if this response is not timely filed, then the Commissioner is authorized to treat this response as including a petition to extend the time period pursuant to 37 CFR 1.136 (a) requesting an extension of time of the number of months necessary to make this response timely filed and the petition fee due in connection therewith may be charged to deposit account no. 12-0415.

Respectfully submitted,

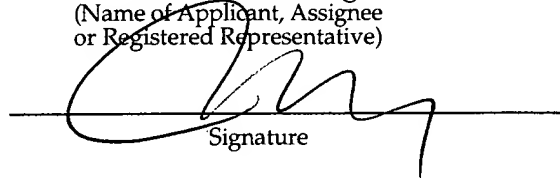


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Enclosures - Check for one-month extension of time  
Petition for one-month extension of time  
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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231 on August 30, 2000.

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(Name of Applicant, Assignee  
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Signature

August 30, 2000

Date